

**STARDUST Project**

**Educational program activities Implementation Plan**

**FINAL**

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## **Introduction to STARDUST Educational Activities**

The STARDUST Education plan is based on the “Goals 2000” from the Department of Education, the “Partners in Education; A Strategy for Integrating Education and Public Outreach into NASA’s Space Sciences Program” from the Office of Space Science, and NASA Strategic Plan. This document explains Stardust’s innovative operating principles and goals for integrating all NASA programs into an educational outreach program.

It is important for NASA as a whole to develop educational opportunities for students at all grade levels. However, smaller missions such as Discovery missions, must limit the extent of their focus. In this way a mission can shrewdly apply limited resources while reaching one age group expertly. STARDUST has narrowed its scope of opportunity and prepared a concise, focused outreach plan. In agreement with this philosophy and in conjunction with leaders in national education, the STARDUST program will concentrate on students in grades three through eight. As the mission develops, curricula may be developed to extend STARDUST into high school education. The aims of the Stardust Education activities are:

1. Reach students before career choices are made and perceptions of capabilities are cemented. To do this, the STARDUST Education Program will focus primarily on grades 3-8.
2. Excite students in the space sciences, engineering, and technology by way of interactive learning via Omniplex, Challenger Center, Jason Foundation, Educational Management Group, JPL Ambassadors Program, and Outer Planets to Inner City Program
3. Produce a long-term learning process in which the students hand-down information to other students throughout the years and that last beyond the duration of the STARDUST mission.

### **STARDUST Education focuses on the following 5 main areas:**

Partnership with the Challenger Center for Space Science Education

Partnership with the Jason Foundation

Partnership with the Omniplex Institute/Kirkpartick Planetarium

Partnership with the Educational Management Group

Outer Planets/Intercity Program

JPL Ambassadors Program

Hands-on educational opportunities

The internet experience for teachers and students

Educational cable network and programming

Virtual hands-on learning

Detailed information provided below:

### **Challenger Center for Space Science Education**

The goals of the Challenger Center for Space Science Education are: to use space exploration as a theme for creating a positive learning experience that raises students’ expectations of success; to foster in them a long-term interest in math, science, and technology; and to motivate them to pursue studies in these areas.

With the help of the US federal government, NASA, and other partnerships such as Lockheed Martin Astronautics, the Challenger Center developed the first Challenger Learning Center facility

at the Houston Museum of Natural Science. There are now more than 30 Challenger Learning Centers across North America which reach over 300,000 students annually. Twenty more Centers are to be developed by 2000.

The Challenger Center prepares curricula for students in grades 5-8 and offers extensions and suggestions for adapting the materials to higher grade levels. At the Challenger Center, each student becomes a crew member on one of eight teams in the Challenger Learning center. Each team participates in the mission control and spacecraft areas. In conjunction with the Challenger Center's program "Rendezvous with Comet Halley," the center will incorporate the more real STARDUST mission scenario and data collection. The program will be updated and its focus will shift to a comet rendezvous mission. STARDUST provides the Challenger Center with current information about the development of the spacecraft and mission, with Wild 2 images, and dust information when received.

In Phase B under contract with Stardust, the Challenger Center developed a curriculum addendum titled *A Little Bit of Stardust: Rendezvous With a Comet*. The curriculum contains the following material: a "Crash Course in Comets"; "Comet History in a Capsule"; "Comets in the News"; a section on the Stardust mission; resources for teachers and students; and a glossary of comet and solar system terms. The curriculum will be distributed to teachers around the country along with the Challenger Center 1996-97 curriculum.

### **The Jason Foundation**

Dr. Robert D. Ballard founded the JASON Foundation in 1989, after receiving thousands of letters from children wanting to know how he discovered the HMS Titanic. Each year, the Jason Project mounts a two-week scientific expedition in a remote part of the world and broadcast in real-time, using state-of-the-art technology, to a network of educational, research, and cultural institutions. The Jason Project reaches more than 500,000 students at 27 downlink sites in the United States, Bermuda, and the United Kingdom. A subset of students and teachers have the opportunity to work as Student and Teacher Argonauts alongside scientists, engineers and technicians at the JASON Project Expedition Site. Student and teacher argonauts serve as role models and translators for students journeying on the expedition via telepresence.

The Jason project describes how it fits into the national education scenario as such:

An important aspect of teacher professional development activities is helping teachers to understand and connect with the national education goals. The goals can help teachers more fully understand the rationale and importance of all of the components of the JASON Project and its potential as a catalyst for exciting and engaging students in the classroom. They provide a framework and context for teachers using the JASON Project. The JASON approach to learning; combining distance learning technologies, on-line services, community based partnerships and teacher professional development programs, makes the project one of the best examples of how school districts can work towards meeting the National Education Goals, known as "Goals 2000".

The STARDUST Project enhances the Jason Project by providing a year-round program. This adds context to inquiries using of Jason On-Line, is involved in each annual Jason exhibit, and adds space-monitoring to the Jason Project. Students will be involved in the end-to-end building of the STARDUST spacecraft and mission and will learn aspects of engineering, science, and navigation.

The Jason curriculum for the 1996 school year incorporates a description of the Stardust Project. During Phase E, the Jason Project will be developing a comet homepage for students under contract with the Stardust project.

### **Omniplex Science Museum**

The Omniplex Science Museum, part of the Kirkpatrick Planetarium in Oklahoma City, is the only science museum in Oklahoma. During Phase B, Omniplex developed a Science Enrichment and Exploration Kit (SEEK) containing materials pertinent to STARDUST and cometary exploration such as models of the universe and "how to make a comet in the classroom." The accompanying curriculum contains general astronomy information as well as specific Stardust information. The curriculum conforms to national standards. During Phase C in the 1996-97 school year, the Stardust SEEK titled *Grasping Stardust: a Discovery Mission Kit* will be piloted in Oklahoma's schools.

Stardust has also been incorporated into on-going Omniplex projects such as teacher workshops and classes. This collaboration is expected to reach 80,000 children and approximately 1,700 teachers. Since schools in states outside of Oklahoma have requested use of Omniplex SEEKs, this number is expected to grow.

### **Educational Management Group**

The Educational Management Group, (EMG), a technology learning company, provides an educational cable type programming for teachers and students. EMG also produces curriculum materials and videos as additional teaching alternatives for teachers. EMG is the educational arm of Simon and Schuster, whose educational division has been acquired by Pearson plc (the international media group) from Viacom. Pearson's involvement in educational technology includes developing electronic media for classrooms and using the Internet to augment textbooks and provide unique teaching solutions. EMG has agreed to a no-cost agreement with the STARDUST Project (agreement number 98-745-142).

### **Hands-on Educational Opportunities**

Both NASA and JPL have a long-standing presence in the educational community. As stated in the Philosophy statement, Stardust Opportunity has carefully considered both new and old mechanisms for attaining the goals of the program -- discarding the outdated and introducing new life into the tried and true. In this vein, Stardust Education supports NASA and JPL representation at teachers conferences such as the National Science Teachers Association and the California Science Teachers Association. In Phase E calendar year 1998 Stardust and JPL will host the annual Challenger Center Teachers Workshop, inviting top educators from around the country to learn about NASA's space program.

### **The Internet for Students**

The Stardust World Wide Web homepage serves the purpose of both public awareness and education. The Stardust homepage has an entire area devoted to teacher and student resources. This area will expand to include interactive contact from students to the Stardust team.